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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,521	02/27/2002	Stephen A. Mastro	83,391	6452

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Office of Counsel, Code 004
Naval Surface Warfare Center,
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EXAMINER

MEYER, DAVID C

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 08/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

10/083,521

Applicant(s)

MASTRO ET AL.

Examiner

David C. Meyer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6-14 and 16-30 is/are rejected.
- 7) ☒ Claim(s) 3-5,15 and 31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 5 is objected to because of the following informalities: the phrase "said outer casing means" is recited without proper antecedent basis. Does the applicant intend claim 5 to depend from claim 1, or from some other claim? Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 18, 20, and 23-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 18 and 20, both claims recite "a portion of said luminescently emitted light sufficiently permeates said outer coaxial fiber optic portion of at least one said light-permeable section". By what measure is "sufficient permeation" to be judged? Does "sufficient permeation" mean "sufficient to enter the inner coaxial fiber optic portion and be transmitted to a photodetector"? Alternatively, does the outer coaxial fiber optic portion itself transmit light to a photodetector? It would seem that sufficient permeation depends not on the light emitted but on the outer coaxial fiber optic portion.

Regarding claims 23-29, it is unclear whether the recited first and second quantities of triboluminescent light emanation are in fact distinct quantities and when these (possibly) distinct quantities of light are transmitted by a fiber optic line. Because

the wording of claim 23 is such that the recited first and second quantities of light seem to be part of a single triboluminescent light emanation, the examiner will search for a single triboluminescent light emanation, as well as for emanations occurring at different portions of a triboluminescent material.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 6-14, 16, 17, 19, 21-23, and 25-30 are rejected under 35 U.S.C. 102(B) as being anticipated by Sage (US 5,905,260).

Regarding claims 1 and 2, Sage discloses a triboluminescent damage sensor for measuring damage to an object such as a building, aircraft part, or bridge. Fig. 1 shows a sensor 1 that contains a triboluminescent crystal 3 that is optically connected to an optical fiber 7 that transmits light to an externally mounted photodetector 8 (C2, L25-34). The detected light may be transmitted as a signal to an operator, whose job is to operate and/or maintain the object (C3, L27-35). (Also, see C3, L27 to C4, L34.)

Regarding claims 6-9, 13, 14, Fig. 7 illustrates a triboluminescent damage sensor comprising a composite layer material 60, which can be called a structure. Fiber optic lines 66, 67, 68 are integrated into "structure" 60. Triboluminescent crystals 61, 62, 63 are also integrated into the structure. When a damage event occurs, the crystals emit light that is transmitted by the fiber optic lines to one or more detectors 70. The respective

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fiber optic lines are in communication with both an internal portion of the structure and with an external portion of the structure.

Regarding claim 10, the structure 60 shown in Fig. 7 comprises a composite of layers. Respective portions of fiber optic lines 66,67,68 are situated between adjacent layers, or "lamina".

Regarding claim 11, Webster's Dictionary defines the term *matrix* as "material in which something else is embedded as for protection or study." Because composite layer material 60 contains embedded fiber optic lines 66,67,68, it can be called a matrix composite structure. One layer of the structure is "a protective layer 72 of composite fibre". The word *protective* implies that this layer provides reinforcement to structure 60.

Regarding claim 12, structure 60 incorporates triboluminescent crystals 61,62,63 and a composite "fibre" protective layer 72.

Regarding claim 16, the fiber optic lines 66,67,68 comprise longitudinal sections that are light permeable. In alternative embodiments, Sage discloses fiber optic lines comprising light permeable end sections (Figs. 1-4.)

Regarding claims 17 and 19, Sage discloses that the photodetector may be responsive to a plurality of wavelengths emitted by triboluminescent crystals at different locations in a structure. In this way, the photodetector is able to indicate which location of the structure has sustained damage. (See C3, L45-52.)

Regarding claims 21 and 22, the device of Sage performs all the steps of the claimed method.

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Regarding claims 23 and 27, the device of Sage performs the method as claimed, including a triboluminescent light emanation step following a damage-causing event. Sage discloses multiple triboluminescent crystals, one or more of which may emit light following a damage-causing event. These individual emissions can be called first, second, third, ... quantities of light emanation.

Regarding claims 25 and 26, Sage provides fiber optic lines having extremity ends that admit light. The triboluminescent material in Sage is located a distance from the fiber optic lines.

Regarding claim 28, Sage discloses multiple fiber optic lines that transmit light emanations to a photodetector. The photodetector indicates when and where light emanations occur.

Regarding claim 29, the photodetector in Sage is capable of receiving any number of transmitted light emanations.

Regarding claim 30, the device of Sage is used in association with objects that are susceptible to damage, such as aircraft wings, buildings, and bridges. The device of Sage could not function if the triboluminescent material and fiber optic lines were not associated with a susceptible location of the damage-susceptible object. Hence, Sage is deemed to anticipate a location-selecting step.

Allowable Subject Matter

6. Claims 3-5, 15, 18, 20, 24, and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and to overcome any

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rejections under 35 U.S.C. 112 2nd paragraph. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 3-5, 18, 20, and 24, the prior art of record does not disclose or fairly suggest the invention as claimed, specifically wherein the fiber optic means includes both an outer casing, outer coaxial portion, or exterior membrane and an inner transmissive means, and wherein at least a portion of the outer casing, outer coaxial portion, or exterior membrane is capable of transmitting light to the inner transmissive means.

Regarding claims 15 and 31, the prior art of record does not disclose or fairly suggest the invention as claimed, specifically wherein a fiber optic line as claimed comprises multiple light permeable portions, each respective one of which is permeable to light of a different wavelength.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Goods (US 6,581,474), Wixom (US 4,991,150), Gaffney (US 5,446,334), Struye (US 6,420,724), Brogardh (US 4,473,747), and Storey (US 6,270,117) each appear to anticipate the inventions of claims 1, 6, and 21.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David C. Meyer whose telephone number is 703-305-7955. The examiner can normally be reached on M-F 8:30-5:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on 703-308-4852. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0935.

DCM
July 25, 2003



DAVID PORTA
SUPERVISORY PATENT EXAMINER
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